

**Ecological, Socio-Cultural, Economic and Political Factors
Influencing the Contribution of Non-Timber Forest Products to
Local Livelihoods: Case Studies from Honduras and the
Philippines**

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Discussion of the role of non-timber forest products (NTFPs) in efforts to reconcile the objectives of forest conservation and rural development has often been hampered by limited understanding of the complexity of the factors that affect the contribution of NTFPs to local livelihoods. By drawing upon two case studies where NTFPs play an important role – the municipality of Lepaterique in Honduras and Palawan Island in the Philippines – this study emphasizes that an ideal extractive system should be based on a mix of products to enable sustainable harvesting throughout the year. The study also demonstrates that considerable attention needs to be paid to the socio-cultural heterogeneity of resource users, and to the value chain structure, access and control over resources and political transparency that affect the opportunities for local people to benefit from NTFP extraction.

Keywords: third world household economies, NTFPs, resin tapping, charcoal, local livelihoods, value chains

INTRODUCTION

In recent years, considerable discussion has focused on the potential of non-timber forest products (NTFPs) to improve tropical forest conservation and local livelihoods. In contrast to the conventional view of NTFPs as ‘minor forest products’, with relatively little or no economic value, the commercial extraction of

NTFPs has been advocated as one of the most sustainable ways to conserve tropical forests and at the same time provide important socio-economic returns to tropical forest dwellers.

Discussion of the role of NTFPs in reconciling the objectives of forest conservation and rural development has often been hampered by limited understanding of the complexity of the factors that affect the contribution of NTFPs to local livelihoods. The prevailing ecological conditions, social relations of production, cultural practices of resource use and economic and political structures have an important role in shaping the significance of NTFPs for forest conservation and poverty alleviation in a particular setting (Salafsky *et al.* 1993, Neumann and Hirsch 2000). Detailed case studies of the ecological, socio-cultural, economic and political dimensions of NTFP extraction are therefore needed to understand better the local-specific factors that either facilitate or constrain the sustainability of NTFP harvesting. Such analyses can offer valuable insights into the complexity of social, economic and political contexts of NTFP extraction and thus contribute to the understanding of NTFP extraction gained through quantitative, macro-scale analyses (Ruíz Pérez and Byron 1999, Ruiz Pérez *et al.* 2004, Belcher *et al.* 2005).

In their analysis of the importance of NTFPs in tropical small-scale forestry, Harrison and Herbohn (2001) concluded that in most cases, commercial extraction of NTFPs is an important – and sometimes the only – source of cash income for forest dwellers that lack formal property rights. Paradoxically, this informality and invisibility that characterizes NTFP extraction in many Third World household economies is also one of the reasons why these products are often considered inferior to timber, and produce little income for those who collect them (Wollenberg 2000, Wunder 2001, Angelsen and Wunder 2003).

This paper aims to illustrate the ecological, socio-cultural, economic and political factors that affect the opportunities and constraints of NTFP extraction in Third World household economies. Two case study areas where NTFPs play a major role in forest use and management have been chosen for analysis, namely the municipality of Lepaterique in Honduras and Palawan Island in the Philippines. A comparative analysis between these two geographically and socially divergent contexts provides an opportunity to examine the complexity of the ecological, socio-cultural, economic and political relations that characterize NTFP extraction in Third World household economies.

The first section of the paper briefly reviews the NTFP categories under analysis, and reports the research method. The important ecological factors that shape the possibilities of sustainable NTFP harvesting are then examined. The next section traces the socio-cultural factors with considerable influence on NTFP extraction, while the fourth section identifies the key factors that need to be considered when estimating the profitability of extraction. Finally, the key political factors that affect the sustainability of NTFP systems are analysed, and some general conclusions and policy implications are drawn concerning the potential of NTFPs for meeting the demands of forest conservation and poverty alleviation.

LOCATIONS AND NON-TIMBER FOREST PRODUCTS UNDER ANALYSIS: CASES OF LEPATERIQUE, HONDURAS AND PALAWAN, THE PHILIPPINES

According to FAO estimates, 41.5% of the Honduran land area was forested in 2005. About 87% of the land in Honduras is classified as inappropriate and unsuitable for intensive agriculture and is best devoted to forestry (Suazo *et al.* 1997, FAO 2005). Lepaterique has an average altitude of 1,400 m above sea level; the annual rainfall is 1,100 mm and the annual mean temperature - measured as the mean of average daily temperatures - is about 20°C. The territory of Lepaterique covers 50,000 ha of land, most of which is owned by the municipality. About 80% of the land has low natural fertility but is suitable for forestry. The dominant tree species in Lepaterique forests is pine (*Pinus oocarpa*), mixed with various species of oak (*Quercus* spp.) (COHDEFOR 2002).

The NTFPs under analysis in Lepaterique include resin, firewood and charcoal. Lepaterique is responsible for 30% of the pine resin, 8% of the firewood and 55% of the charcoal produced in Honduras. In 2003, the economic value of resin production was USD204,521, of charcoal production USD40,362 and of firewood production USD37,139 (AFE-COHDEFOR 2003). The municipality of Lepaterique has a population of about 14,450 (PNUD 2004), and resin tapping, firewood production and charcoal extraction together form one of the major sources of income among the majority of Lepaterique households (Oseguera de Ochoa 1993, 1999, Nygren 2005).

In the Philippines, the high rate of deforestation throughout the past century has led to the current importance of Palawan as a commercial NTFP extraction area. In 1934, forests covered 53% of the total land area of the Philippines, comprising 15.9 M ha of land (FMB 1997). Due to intensive logging, forest cover decreased enough to be considered a crisis situation by the government in the 1970s, when timber logging allocations were revoked and reforestation programs were implemented. Recent figures show that forests cover about 18% of the country's total land area. Palawan Island, with a total area of almost 1.5 M ha, of which slightly less than a third is classified as forest, is one of the last forested provinces in the Philippines (FMB 2002).

In Palawan, the most important NTFPs are the resin of the almaciga tree (*Agathis philippinensis*), rattan (*Calamus* sp.) and honey. During the past century, almaciga resin could be obtained from many Philippine islands, but today the only commercially viable source in the Philippines is Palawan (FMB 2002). The history of almaciga resin thus mirrors the history of deforestation in the Philippines. Although many other NTFPs, such as unsplit rattan and buri (*Corypha elata*) are also important NTFPs on Palawan, these products are still available from other, more accessible areas in the Philippines. The emphasis in this analysis will therefore be on almaciga resin and honey.

DATA COLLECTION METHOD

Both qualitative and quantitative data collection, from both primary and secondary sources, have been employed. Field research in Lepaterique was carried out from February to May 2003 and in March and April 2004, by a team consisting of an environmental anthropologist and a forest economist. During these periods, semi-

structured and open-ended interviews were conducted with a total of 118 local resource users¹, community representatives and members of community-based organizations, as well as with officials in municipal and state governments, non-governmental organizations, development project organizers and staff of research institutions. For semi-structured interviews, a matrix of theoretically important criteria was developed in order to identify potential informants, including the attributes of livelihood strategies, main sources of income, age, gender, social position, political affiliation, and experience of NTFP extraction. Semi-structured interviews, which focused on economic information on NTFP extraction, were carried out with 38 households.

Intensive group discussions and thematic workshops were held with representatives of central and municipal governments, local cooperatives and producer associations, as well as with groups of local resource users. Data collected in this way were complemented and crosschecked by participant observations at official meetings, people's daily production activities, and informal social gatherings. In addition, semi-structured interviews were conducted with 30 NTFP transporters, intermediaries, processors and retailers. Many of these interviews were complemented by visits to the stores, outlets and processing facilities, and discussions with persons working in these places. Statistics on NTFPs, development reports, archival material and other relevant secondary data were subjected to content analysis.

Data for analysis of the case of Palawan are based on semi-structured and open-ended interviews carried out over several months in 1998-2000 with residents of the communities dependent on NTFP collection for their primary and secondary sources of income. Residents of the villages of Boong and Manaile in the municipality of Narra were questioned about almaciga resin, while the data on the honey trade were gathered from the municipality of Aborlan. During the fieldwork, local forest service personnel and other governmental officials, NGO staff, and the community councils of elders were also interviewed. Follow-up interviews were conducted in September 2004 with the tribal elder of Boong, NGO staff concerned with a legal case pending for NTFP collection licenses, and local traders of NTFPs. Several NTFP processing areas were also visited. These primary data were complemented by recent statistics from the local government of Palawan and the Philippine Department of Environment and Natural Resources (DENR).

In the analysis of the socio-cultural and political dimensions of NTFP extraction, social mapping and network analysis were utilized. Social mapping was designed to identify the various actors and networks involved in the production, transportation, processing and final sale of NTFPs, while network analysis tools were used to understand how local livelihoods and resource use rules are linked to wider social and political structures. A commodity chain analysis was carried out to assess the economic value of the NTFPs, drawing on the approaches developed by Belcher (1998), Ribot (1998) and Taylor (2005). An analysis of prices, quantities of goods handled, revenues and costs of production enabled estimates to be made of the

¹ Because no accurate list of population members was available, it was not possible to employ random sampling techniques. However, the respondents were considered as acceptably representative of the population. In any survey where the participants must consent to be interviewed, there is always an element of self-selection and possible bias (Seidman 1998).

profits gained by the parties at each level of the value chain. These analyses offered a valuable tool for understanding who benefits from NTFP extraction, how they benefit, and how these patterns of benefit distribution might be changed.

ECOLOGICAL FACTORS OF NTFP EXTRACTION

Examination of the multifaceted interactions between ecological, socio-cultural, economic and political dimensions of NTFP extraction is a complicated task. Physical and ecological characteristics of a given locality – such as temperature, rainfall, topography and soil quality – influence the formation of particular kinds of social patterns, economic relations and cultural practices concerning resource extraction. Correspondingly, political processes, economic relations, and socio-cultural practices – including resource tenure, value chain structure, institutions controlling resource access, and cultural values attached to the environment – have an important role in shaping the ecological conditions of a particular NTFP system (Leach *et al.* 1999, Neumann and Hirsch 2000). In this section, species distribution, seasonality and harvesting techniques are analyzed as some of the key factors that shape the ecological, socio-cultural and economic sustainability of NTFP extraction. The relationship between key factors is illustrated in Figure 1.

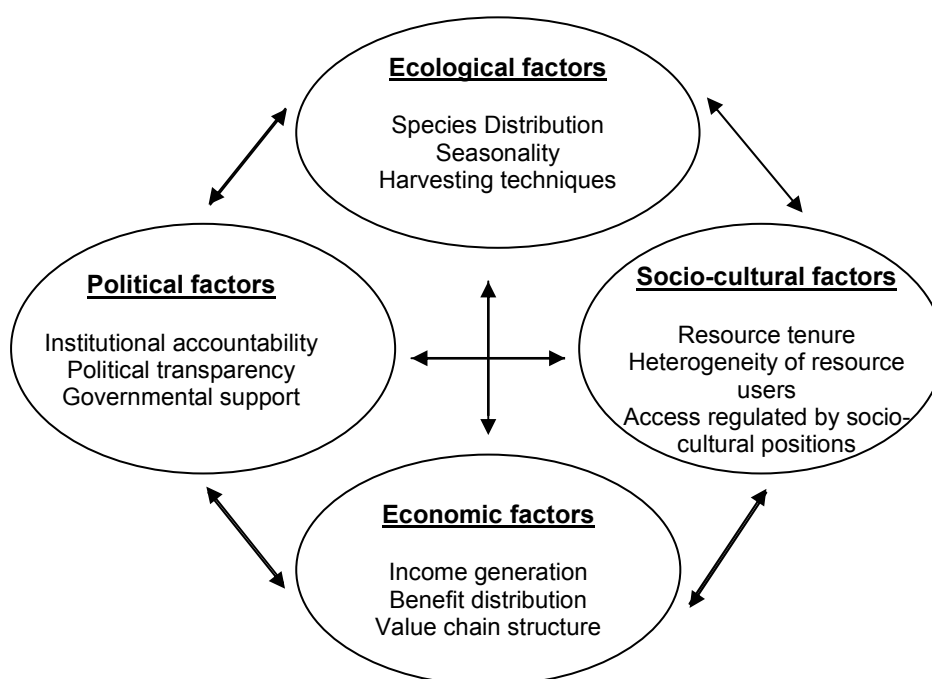


Figure 1. Key factors affecting NTFP extraction systems in Lepaterique, Honduras, and Palawan, the Philippines

The Case of Lepaterique

An important ecological factor influencing the success of NTFP extraction is the distribution of the desired NTFP species in the forest (Salafsky *et al.* 1993). In managed pine forests in Lepaterique, the number of tree stems under resination varies from 50 to 200 per hectare. This makes the time needed to move between the target individuals moderate and thus keeps the costs of production reasonable. A more critical issue concerning the ecological sustainability of NTFP extraction in Lepaterique is the competition of various forest activities for the same space. The municipality of Lepaterique has a forest management plan for 14,340 ha of municipal land. Of this area, 3,112 ha (21.7%) carries pine forest in varying stages of development. According to the forest management plan, resin tapping and logging can be practiced consecutively in the same areas. In practice, however, resin tapping and logging compete with each other. According to local resin harvesters, a pine tree can be tapped for 25-30 years, whereas the forest authorities argue that the trees should be tapped for 5-8 years and then harvested, to guarantee the quality of timber. At present, 50% of the forests in Lepaterique are mature or over-mature because of prolonged resin tapping (COHDEFOR 2002). Firewood production and charcoal production do not compete equally strongly with logging, because these activities take place in association with mixed forests and logging residues.

Another factor affecting the success of NTFP extraction is the temporal availability of the products. The fact that resin can be harvested year-round (although production is lower during the rainy season of July-February) enables Lepaterique resin tappers to earn a small but steady cash income throughout the year. The production of firewood and charcoal is more intensive during the dry season. However, as non-perishable products, firewood and charcoal can be stored prior to marketing, which increases the opportunity of the local extractors to earn an important, though sporadic, cash income throughout the year.

One of the most important ecological questions related to NTFP extraction is how much of the resource can be harvested without diminishing its capacity to regenerate. Resin tapping has been practiced actively in Lepaterique since the 1950s, and the target resources have so far not been overexploited. However, some resource degradation is evident, mainly due to destructive harvesting techniques. In conventional tapping, numerous incisions are made on the tree trunk with a machete, which produces low-quality resin and renders part of the tree unmarketable as timber. In the worst case, conventional tapping can severely injure or kill trees. In recent years, Lepaterique harvesters have been trained to tap the resin by using a less damaging method which involves installing a canal blade and cup in each tree. The production costs are higher and resin yields may decrease slightly, but the timber is available for sale at the end of resination (Sánchez 2001). Unsuitable tapping methods may also affect the regeneration of *Pinus oocarpa*, which has been poor in Lepaterique in recent years. However, it is difficult to separate the impact of resin tapping from other influences on forest regeneration, such as soil quality, climatic variations, fire and grazing.

Production of firewood and charcoal faces the risk of overharvesting in Lepaterique because of the low profitability of sustained yield extraction, combined with poorly defined resource rights. This translates to a lack of incentives for producers to practice long-term forest conservation. The fact that production takes place in increasingly remote areas increases the costs of bringing the products to

market. Contraband of firewood, charcoal and timber is also widespread due to the lack of efficient law enforcement. Recent institutional changes, including decentralization and participatory forest management, have increased local support for conservation and thus improved the ecological conditions in Lepaterique forests.

The Case of Palawan

The location of Palawan Island is credited for the high degree of endemism of its plant and animal species, with one in 10 of the species found in Palawan not found naturally anywhere else (Widmann 1998). The high biodiversity is reflected in the relatively high number of NTFPs gathered from Palawan forests. According to a survey conducted in 1999, more than 50 distinct plant NTFPs have commonly been harvested for household use in the studied communities. The most intensively collected species have been the NTFPs that had a commercial niche, including almaciga resin, rattan and honey (Lacuna-Richman 2003).

The low frequency of individual species in the biodiversity-rich Palawan forests means that relatively large areas of forestland are required for the sustainable harvesting of a particular species. Up till the 1980s, about 10 productive almaciga trees were found per hectare of Palawan forests; at present, there are five or fewer productive trees per hectare. Due to the low frequency of almaciga trees a relatively long time is needed for gathering and thus the profitability of commercial extraction decreases.

The most intensive almaciga resin harvesting period is the dry months of January to March. For the rest of the year the resin collectors have to supplement their income with other activities, including rice farming, fishing, hunting, odd jobs in transportation and off-farm employment. Due to decreasing yields, an increasing number of collectors have begun to tap resin throughout the year, which gives the trees less time to recover.

Another ecological factor affecting the sustainability of almaciga resin extraction in Palawan is the gradual attrition of productive stands because too many people are engaged in tapping, forestland is being transformed into agricultural plots, and low forest-gate prices compel collectors to over-harvest the resin in order to meet quotas. The degradation of almaciga stands was recognized by the forest service as a problem back in the 1970s, when technical guidelines for sustainable harvesting were disseminated in the form of publications and extension workshops. These guidelines included making cuts in the bark that would not damage the cambium and that had to be 60 cm apart diagonally and no more than 40 cm wide. A minimum dbh of 40 cm was recommended for trees to be tapped. The informants surveyed in this study were well aware of these principles. However, the need to collect enough resin for income and the decreasing amount of resin that can be tapped from less healthy trees have caused many of the collectors to disregard sustainable harvesting techniques.

Honey has been a traditional forest product for Palawan's indigenous people for decades. However, the federation of Palawan's indigenous people (the 'United Tribes of Palawan' or NATRIPAL) did not include honey in its development strategy until 1990, at which time the honey trade became better organized. Palawan is home to seven *Apis* species, two of which have commercial significance, namely the Asiatic hive honey bee (*Apis cerana*) and the giant honey bee (*Apis dorsata*). The dry months of February to April are the peak season for honey collection. A

team of gatherers usually stays in the forest from two to five days at a time, foraging 10-20 hives per trip, with the average yield of 3.4 kg per hive. During the peak time, families can devote as much as 80% of their working time to honey extraction, partly because reaching productive hives in the forest takes time, and partly because smoking the hives is a slow and painstaking task. During the off-season, the gatherers derive their income from agriculture and temporary off-farm work. Because of the high seasonality, none of the households can earn their entire cash income from honey extraction.

Considering the almaciga resin and honey together, NTFP production can still be regarded as ecologically feasible in Palawan, although subject to particular constraints. In terms of ecology, sufficient forest resources and relative abundance of plant species that support NTFP extraction are required. The tree species important as food sources for bees, including wild rambutan (*Nephelium* L.), apitong (*Dipterocarpus* Gaertner F.), bulia (*Shorea acuminata*) and taluto (*Pterocymbium beccarii*), are still abundant in the forests of Aborlan. For resin production, the establishment of almaciga plantations is essential unless replanting in the natural forests is undertaken.

SOCIO-CULTURAL FACTORS IN NTFP EXTRACTION

A better understanding of the NTFP activities within Third World household economies requires careful consideration of the particular socio-cultural context in which NTFP extraction occurs. In contrast to conventional views of local communities as units of homogeneous households with common goals and shared norms, recent studies of local livelihoods have emphasized the heterogeneity of local communities and their diverse ways of perceiving and using natural resources (Agrawal and Gibson 1999, Kellert *et al.* 2000, Nygren 2000, 2005). In this section, resource tenure, diversity of resource users, and access regulations by socio-cultural positions are examined as important socio-cultural factors that affect the sustainability of NTFP extraction (as illustrated in Figure 1).

The Case of Lepaterique

A complex land tenure system exists in Lepaterique, as elsewhere in Honduras. Officially, the land is owned by the municipality; however, the municipality has granted usufruct rights to local inhabitants, with land divided into parcels for individual households. The municipality recognizes the customary rights of local parcel holders, although in a legal sense such usufruct rights are not recognized by the state. This uncertainty in resource tenure decreases the extractors' incentives for forest conservation and hence decreases their livelihood security.

When mapping the everyday use of forest resources in Lepaterique, a complex picture of multiple actors emerges, with diverse and often conflicting resource-use priorities. The residents of Lepaterique are socially differentiated in terms of access to land, size and quality of land parcels, degree of participation in income-generating activities, age, gender, social position and political power. These differences provoke a variety of competing claims to forest resources. The resin tappers and firewood and charcoal producers of Lepaterique see a forest as an ideal place for

NTFP extraction, the loggers are mainly interested in timber cutting, and the farmers are attracted to forest clearing for agriculture.

Resin tappers and producers of firewood and charcoal also compete for forest resources. Resin tappers are highly motivated to protect the forests against fires, while the firewood and charcoal producers occasionally start forest fires to obtain a permit to produce firewood or charcoal. Conflicts of interests related to NTFP extraction are also found along gender lines. Women have limited access to firewood and charcoal production in Lepaterique because most of the usufruct rights are registered in the name of the husband, and the commercialization of firewood and charcoal is considered a male task. Under these conditions, women prefer increased participation in resin tapping.

A wide array of socio-cultural mechanisms, based upon norms of reciprocity and dependence, also regulate the NTFP production and commercialization in Lepaterique. In the case of charcoal extraction, for example, producers sell to intermediaries, who advance money and supplies and confer various kinds of favours on producers in exchange for exclusive rights to their products. Because most of the contracts are based on unwritten agreements and cheating is a highly developed art, social ties of loyalty and dependence between business partners are important all along the chain. Each delivery takes place face-to-face in order to check the amount and quality of the product supplied, negotiate the price, and ensure that payment is actually made. These time-consuming acts reduce the efficiency and profitability of the business, while the hierarchical relations of dependence and loyalty increase the social inequality in the access and control over resources.

The Case of Palawan

In Palawan, as in other Philippine provinces, forestland is officially owned by the state; however, the government can cede the management of particular forest areas to communities or companies through various legal instruments. Among the most relevant legal instruments are the Certificate of Ancestral Domain Title (CADT) and the Community-Based Forest Management Agreement (CBFMA). In Aborlan and Narra, the attitudes towards CADT and CBFMA are divided along ethnic lines. The indigenous people prefer the CADT, which gives them resource rights over the collection of NTFPs and tenure rights over the forest itself. In the case of CBFMA, equal rights are given both to migrant and indigenous population, at least in theory. The indigenous Tagbanua in Narra applied for their CADT in 1988, but have not acquired it yet. In Aborlan, 756 ha of land were declared a CBFMA-type communal forest zone in 2000.

The resin trade has an important role in regulating the socio-cultural relations between ethnic groups in Palawan. According to a survey conducted in 1999, 40% of the Tagbanua reported the almaciga resin collection as their main source of income, with an additional 41% mentioning it as a secondary source of income. For the migrant population, resin collection was the main source of income for 20% of the informants and the secondary form of income for another 16%. Although indigenous and migrant inhabitants have formed joint teams for almaciga gathering, it is usually the first-to-third generation migrants who are able to obtain a license for resin extraction and maintain contact with resin buyers. Thus, indigenous people frequently depend on migrants as middlemen for the marketing of resin (Lacuna-Richman 2004). The resin trade in Palawan is regulated by socio-cultural norms of

loyalty and dependence. Intermediaries are considered indispensable because they provide advance payment, loans and goods for gatherers and because they market the resin in urban centres. In exchange, they have leverage to set the forest-gate prices of resin.

The prospects for a more socially comprehensive extraction are greater in the case of honey because of its inclusiveness between genders, across generations, and among social sectors and ethnic groups. Although the collection of honey is a male-dominated activity, women participate in honey processing and marketing. The intermediaries in the honey trade do not have as much power as those who deal in resin because the commercialization of honey is carried out by NATRIPAL, together with the assistance provided by the University of the Philippines at Los Baños and governmental offices.

ECONOMIC FACTORS IN NTFP EXTRACTION

When analyzing the value chains of NTFPs within Third World household economies, a complex picture of economic relations between producers, intermediaries, manufacturers and retailers emerges, with diverse elements of coping, cooperation and collusion. In this section, income generation, benefit distribution, and value chain structure are examined as key factors that affect the ecological viability of forest management, as well as the potential of NTFPs to alleviate rural poverty and improve the social and political inclusion of forest dwellers (Figure 1).

The Case of Lepaterique

In Lepaterique, most of those residents who have usufruct rights to parcels with mixed forests participate in charcoal production. The amount of charcoal produced varies according to the season, the availability of permits granted by forest authorities, and each producer's opportunity to begin production depending on the availability of time, money and labour. The average daily income of a charcoal producer in Lepaterique was 39 lempiras (Lps) (USD2.17) in 2004 (Keinänen 2004), which is equivalent to the average daily cost of living for a household with five members in Honduras (INE 2004)². The minimum daily salary set by the government for a worker engaged in agriculture or forestry was 54.70 Lps. However, it is important to note that charcoal production is an irregular source of income, and its significance as a livelihood strategy varies considerably among the producers. The yearly income derived from charcoal production by an average producer in Lepaterique was 1386 Lps in 2004 (Keinänen 2004).

Firewood production is another source of income for many households in Lepaterique. As in the case of charcoal, each firewood producer sells his product individually to an intermediary who then sells the product to retailers in Tegucigalpa. The average daily income of a firewood producer in Lepaterique was 13.5 Lps in 2004, which is much less than the daily costs of living or the minimum salary of an agricultural worker. Despite the small income it generates, occasional

² The exchange rate was approximately 18 Lps to 1 USD in March-April 2004.

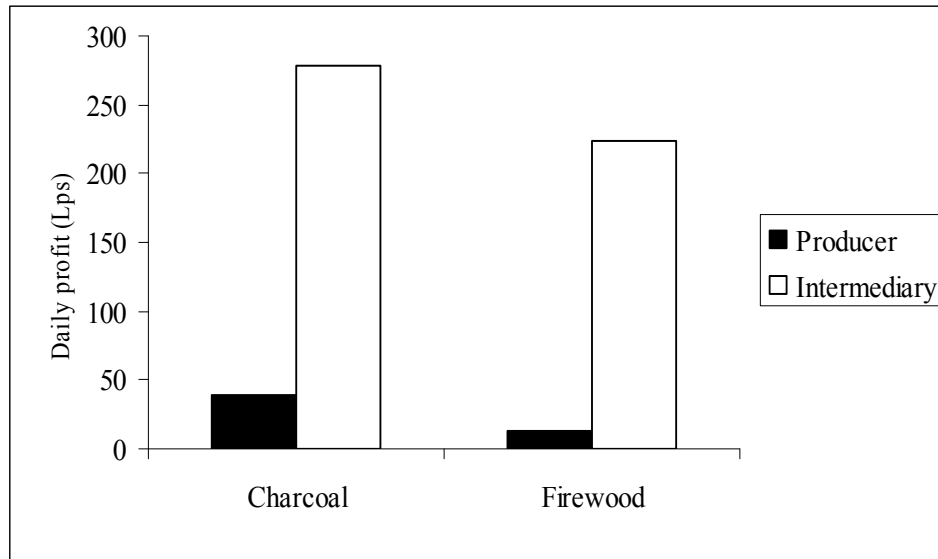
production of firewood is often the only option available to Lepaterique residents to gain some extra cash because few other income-earning opportunities are available.

Resin is the major source of a more regular income for one third of households in Lepaterique. A local cooperative was established in 1974 to carry out the commercialization of resin. Each resin tapper owns the trees they use for tapping, although the municipality owns the land under resination. A resin tapper needs about 500 trees to produce one barrel a month; some households produce four barrels a month, while the majority produce one barrel or less. During one month, a resin tapper spends four days on average gathering resin. The average daily income was 90 Lps in 2004, which was considerably higher than in the case of other NTFPs. A problem is that the resin tappers do not have enough land to increase their production. An oligopsonistic market structure, dominated by the three companies that purchase the raw resin at a fixed price, further limits the earnings of the producers. The market demand for raw resin is high in Honduras, but the Honduran resin processors face stiff competition in international markets, especially from China, the world's largest producer of resin (FEHCAFOR 2002).

As demonstrated by Ribot (1998) in the case of Senegal, access to forest resources does not automatically guarantee the producers' ability to benefit from NTFP extraction. In Lepaterique, charcoal and firewood producers have customary rights to parcels under their usufruct. However, they are not the chief beneficiaries of extraction. Because of their lack of collateral in the form of land title, local extractors have difficulty in obtaining bank loans. As a consequence, they are economically dependent on intermediaries, who then regulate the prices and marketing opportunities. In 2004, a charcoal intermediary in Lepaterique earned 6.14 times as much as a charcoal producer per working day, and a firewood intermediary earned 16.23 times as much as a firewood producer (Figure 2). In addition, the work input of a charcoal intermediary was 30% less than that of a charcoal producer and that of a firewood intermediary 80% less than that of a firewood producer³. Even if the financial risks borne in unpredictable markets were taken into account, the profit margin gained by intermediaries is inequitably high.

As a whole, when analyzing the costs and benefits to the various actors within the NTFP chains relevant in Lepaterique, a relatively skewed picture of the distribution of benefits emerges. The sporadic income derived by producers provides barely enough to ensure a basic living, while more substantial profits accrue to intermediaries, manufacturers and retailers (Keinänen 2004). The value chain structure for NTFPs in Lepaterique is based on hierarchical patron-client relationships and subject to high inequality in income and welfare distribution.

³ Because of the informality of NTFP activities, it was not possible to obtain reliable data of all the transaction costs that the NTFP producers and intermediaries have in Lepaterique; a situation typical of the studies of informal economic activities in developing countries. In the calculations of profit, direct material costs and conversion costs were deducted from revenues. The work input was calculated according to the hours worked in the activity per year.



Source: Adapted from Keinänen (2004).

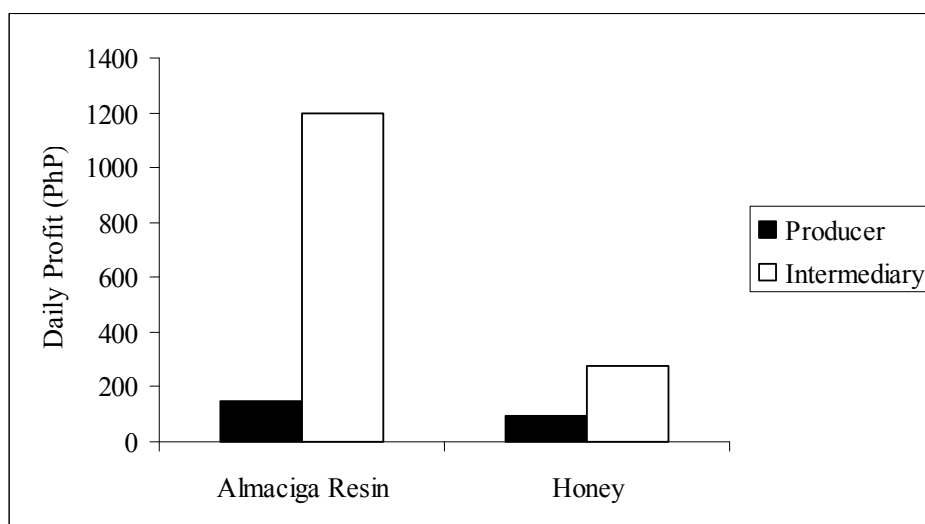
Figure 2. Average daily profit of charcoal and firewood producers and intermediaries in Lepaterique in 2004 (in Lempiras)

The Case of Palawan

Complex relations of clientelism characterize the networks linking NTFP gatherers and intermediaries in Palawan. Resin collectors received 6 pesos (0.11 USD) per kg of almaciga resin in 2004, a price that has not increased since 1998⁴. Many collectors accept the price set by the intermediaries because they desperately need the income to pay debts incurred on basic living expenses and to meet various financial emergencies. The power of middlemen in defining the forest-gate prices is further strengthened by the role they play in extraction. If male, they often organize the resin collection teams; if female, they may be in charge of grading the resin's purity. The middlemen also control the resin trade through their better access to transport and information about price fluctuations in the market. In 2004, an intermediary received on average 12 pesos per kg of resin in Puerto Princesa. Even if the costs of transportation and the risks borne are considered, the intermediary's profit margin is high (Figure 3).

An oligopsonistic market structure dominates the almaciga resin trade in Palawan, and the difference between forest gate and urban market prices is substantial. The resin buyers in Puerto Princesa can earn a considerable profit from the sale of graded resin to exporters, with little physical labour involved. The Philippine resin exporters face stiff competition from resin suppliers from other countries, most notably China.

⁴ The exchange rate was approximately 54.5 PhP to 1 USD in 2004.



Source: Lacuna-Richman and Alsá: Field data.

Figure 3. Average daily profit of almaciga resin and honey producers and intermediaries in Palawan in 2004 (PhP)

In 2004, honey was sold for 55 PhP/kg at the local level on Palawan, and at 80 PhP/kg for NATRIPAL or for any bulk buyer in Puerto Princesa. As shown in Figure 3, profit margins are more equally distributed between producers and intermediaries in the case of honey than for almaciga resin. This is the case because honey producers have organized themselves as a cooperative, and their main intermediary, NATRIPAL, has also been instrumental in starting the venture with fair trade as an objective. Also, honey gatherers are better informed of the price fluctuations throughout the value chain. The officials of NATRIPAL visit the local cooperatives regularly to buy honey, but financial constraints do not permit them to purchase all the honey on offer. In fact, NATRIPAL's honey project is in danger of being discontinued in the near future due to the lack of funds to employ staff for honey marketing. It remains to be seen whether the local cooperatives will be strong enough to take over the honey commercialization.

POLITICAL FACTORS IN NTFP EXTRACTION

Without considering the political structures and institutional networks in which the NTFP activities are embedded, it is difficult to understand the operation of NTFP systems, especially in the Third World. Forest policies have an important role in shaping resource access, extraction practices and NTFP trade. However, these policies shape only a part of the process; the rest is shaped in the spaces between formal and informal – and legal and non-legal – mechanisms. In this section, institutional accountability, political transparency and governmental support are analyzed as important political factors that affect the ecological viability and the social distribution of the benefits derived from NTFP extraction (Figure 1).

The Case of Lepaterique

In Lepaterique, municipal and state forest officials regulate the levels of NTFP production and trade by granting wood cutting permits, as well as transport and merchant licenses. Due to financial and administrative problems, the municipal government has had difficulty managing Lepaterique forests according to the principles of institutional accountability and political transparency. Some authorities who are responsible for controlling illegal forest extraction are themselves part of the business. Persons within the authorities' inner circles – relatives, political allies and influential bosses – use networks of patronage and favouritism to secure permits to extract products in quantities in excess of the quotas. From the perspective of the more marginal sectors of the population, the tight restrictions on forest use are unjust inasmuch as powerful operators avoid prosecution for violations of the law by engaging in political manipulation and bribery. Despite widespread objections by local people, municipal authorities have difficulty denying the requests of powerful operators. Officials who do not comply with the demands of an influential political and economic operator face a serious risk of being ousted from their post or otherwise intimidated.

In recent years, the empowerment of local forest users through participatory programs has encouraged local people to challenge the traditional forms of authority and to address the problems of unequal access to resources. Local residents are now actively pressuring government authorities during municipal council meetings and informal social gatherings, in order to defend local resource rights and to improve the local control over economic opportunities related to forests. They also criticize corruption and unequal resource distribution.

The limited political support given by the central government to social forestry also constrains the development of more sustained NTFP systems in Lepaterique. The contribution of NTFP extraction to rural livelihoods is critically dependent not only on favourable local conditions but also on various far-reaching institutional and political mechanisms, including forest legislation, forest policy and forest product markets. Greater governmental commitment to policies that recognize the importance of NTFPs for local livelihoods is needed before NTFP extraction can be developed as an attractive, long-term strategy for forest conservation and rural development in Lepaterique, as elsewhere in Honduras.

The Case of Palawan

In Palawan, former almaciga resin concession holders belong to some of the politically most powerful families within the municipalities studied, and despite the end of the concession system, many of them still control the resin trade via powerful patronage relationships. Local organizations of NTFP producers are politically efficient as far as the internal division of tasks and profits is concerned. However, they find it difficult to make their voices heard in larger political and economic arenas.

Current forest policy in the Philippines is officially geared towards community forestry, and various legal instruments – such as the CADT and the CBFMA – have been created in order to ensure the political rights of forest communities to local natural resources. However, these instruments for decentralizing the power over forest management are also a source of confusion and suspicion, and there is limited transparency in the implementation and monitoring of resource access. In fact, the

dearth of governmental support for local empowerment is evident even in communities with legal rights to local forests (Contreras 2000). This lack of governmental support makes such locations as the municipalities of Narra and Aborlan arenas of action for NGOs who are able and willing to provide at least temporary financial and political assistance for marginal forest-dependent communities. Nevertheless, many of these organizations are themselves dependent on external funding and assistance, and some of them are co-opted or dominated by the local elite or foreign consultants. Although the forms of cooperation such organizations are able to provide are variable and fragmented, they are much better than having no cooperation at all.

One of the most important political challenges facing the NTFP trade in Palawan is the need to improve the bargaining power of local producers in relation to outside merchants and policy-makers. This is evident especially in the case of almaciga resin, where local gatherer organizations are too weak to command higher prices for their products and greater institutional accountability in regard to extraction licenses. At best, grassroots associations supported by a committed and reliable mediator, such as NATRIPAL, can be successful in improving the political transparency of forest governance and bringing about a more equal distribution of benefits related to NTFP extraction.

CONCLUDING COMMENTS AND POLICY IMPLICATIONS

This study has shown that complex ecological, socio-cultural, economic and political processes shape the relationship between NTFP extraction, forest conservation and local livelihoods. While NTFP extraction can play an important role in promoting forest conservation and alleviating rural poverty, its effectiveness cannot be taken for granted (Shanley *et al.* 2002, Belcher *et al.* 2005). Dynamic interactions between a large set of ecological, socio-cultural, economic and political factors and their effects need to be considered when identifying the constraints and opportunities that affect sustainable NTFP extraction. The main findings concerning these interactions in the case of Lepaterique and Palawan are summarised in Table 1 and in Figure 4.

First, the case studies of Honduras and the Philippines have shown that the opportunities for sustainable NTFP production are highly dependent on the prevailing ecological conditions, including species diversity, seasonality and harvesting techniques. Any effort to improve the profitability of NTFP extraction has to consider carefully the possible effects in terms of ecological sustainability. When NTFP extraction is intensified or the prices of the extracted products rise, overexploitation may follow if extractors and merchants seek quick profits. If prices fall, ecological degradation may follow because extractors must harvest the resource above sustainable thresholds to maintain their living standards. As proposed by Salafsky *et al.* (1993) and Belcher (1998), an ideal extractive system should be based on a mix of products for which the availability and demand periods are staggered to enable sustainable harvesting throughout the year. Important gains in ecological sustainability can also be achieved by adopting harvesting techniques that do not damage the trees and that comply with minimum dbh constraints.

Table 1. Key factors of NTFP extraction systems in Lepaterique, Honduras and Palawan, the Philippines

Factor	Lepaterique	Palawan	Effect
Ecological factors:			
Species distribution	Low	High	Has an effect on time needed for gathering and on economic profitability of extraction
Seasonality	Slightly seasonal	Seasonal	Has an effect on steadiness of extraction income
Harvesting techniques	Slight overharvesting	Overharvesting	Has an effect on species regeneration, ecosystem functions and livelihood security
Socio-cultural factors:			
Resource tenure	Uncertain	Uncertain	Has an effect on incentives for conservation and livelihood security
Heterogeneity of resource users	High	High	Has an effect on probability of resource conflicts
Access regulated by socio-cultural positions	Moderate to high	High	Has an effect on equality of resource use and control
Economic factors:			
Income generation	Low, irregular	Low, irregular	Has an effect on ecological viability and on opportunities for earning a living
Benefit distribution	Skewed	Skewed	Has an effect on power relations and social differentiation
Value chain structure	Hierarchical	Hierarchical	Has an effect on income and welfare distribution
Political factors:			
Institutional accountability	Low	Low	Has an effect on ecological viability and social distribution of benefits
Political transparency	Low	Low	Has an effect on democracy and reliability of resource management
Governmental support	Low	Low	Has an effect on attractiveness of extraction and on livelihood security

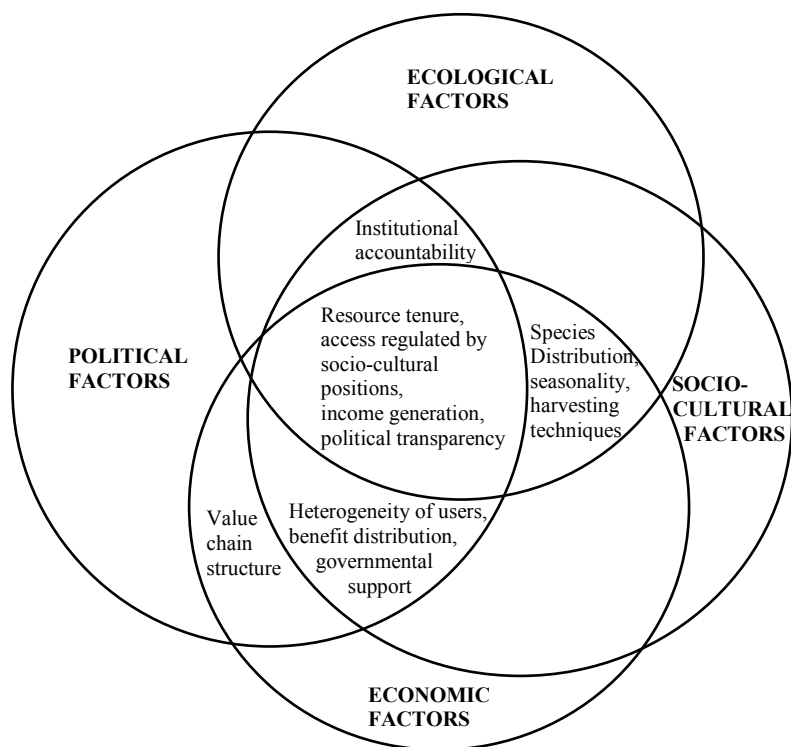


Figure 4. Main areas of influence of the key factors affecting NTFP extraction systems in Lepaterique, Honduras and Palawan, the Philippines

Concerning socio-cultural sustainability of NTFP extraction, a more diversified approach is needed that recognizes the multiplicity of actors and their conflicting resource-use interests. In both case studies, the contribution of NTFPs to local livelihoods is highly differentiated by gender, socio-cultural identity, economic position and political power. In Third World household economies, where different forms of land use tend to compete with each other and livelihoods are based on multiple strategies, NTFP extraction has to be considered as part of a diversified portfolio of earning a living and coping with social vulnerability.

Although income-earning activities based on NTFPs are crucial for many Third World households, their main significance often lies in providing an occasional source of income and an economic buffer during hard times (Wunder 2001). As demonstrated by the cases of Lepaterique and Palawan, local forest dwellers engage in labour-intensive NTFP activities mainly because of the absence of alternative sources of income and because these activities can generate important supplementary income. Large investments in production quality, processing and marketing enhancement are needed before NTFP activities can lead to long-term economic advancement under these conditions.

Both case studies also demonstrate that the profits from NTFP extraction tend to be unequally distributed along value chains in which networks are based on a host of intermediaries and patron-client relationships. In Lepaterique, resin tappers and firewood and charcoal producers take home only a small portion of the benefits, while transporters, urban merchants and processing plant operators reap the largest share (Keinänen 2004). The situation is similar in Palawan, especially in the case of almaciga resin. The actors at the lower levels of the chain are linked to the higher level actors through debt relations, which give the latter considerable leverage in setting the terms of trade.

When assessing the contribution of NTFP extraction to poverty alleviation, attention also needs to be focused on the political processes through which the various actors with divergent interests interrelate. In both case studies the practices of NTFP extraction are embedded within hierarchical power relations and stratified institutional networks, involving mechanisms of political manipulation, clientelism and bribery. The lack of institutional accountability and political transparency has considerable effects on the ecological viability of extraction, on the reliability and profitability of resource management, and on the social distribution of forest-related benefits.

Although there are no simple recipes for the creation of more sustainable forms of NTFP extraction, on the basis of the analyzed case studies a number of strategies appear worth considering.

1. The promotion of more sustainable NTFP systems requires mechanisms that address the inequalities in the access to forest resources and in the ways they are used and managed. Establishment of more secure resource rights would require legal reforms to redress the structural inequalities that prevent local NTFP extractors from defending their resource claims.
2. More equal distribution of forest-related benefits is needed. In this respect, the development of more integrated forest management plans that include both timber and non-timber forest products would be beneficial. Such plans could help forest authorities and local resource users recognize the ways various forest activities complement and compete with each other in local livelihood strategies. This could also force the forest authorities to become more aware of the resource rights of NTFP extractors. The efforts to achieve sustainable NTFP extraction should be tailored to deal effectively with the existing social, economic and political divisions. Populist agendas for grassroots participation and local empowerment should be replaced by realistic strategies that recognize the needs of actors with differentiated resource interests.
3. Strengthening of local producer associations can facilitate the sharing of capital expenditures for equipment and create opportunities for the coordination of small-scale lending. The development of collaborative networks with similar groups elsewhere can increase the capacity of local extractors to develop their operations and improve the quality of their products. The forging of horizontal links with other NTFP associations can also provide means for information sharing and political leverage in lobbying for changes in governmental policies. Making improvements to the bargaining power of the local producers in relation to

markets and governmental policies, is crucial although not easy, given that NTFP economies are subject to booms and busts and NTFP markets are being exposed to increasingly sophisticated demands.

4. Institutional investment and capacity building also play an important role in any effort to develop more sustainable NTFP extraction systems. In order to reduce the tendency for powerful political and economic operators to set the terms of forest use, it is important that local inhabitants have the opportunity to periodically review the decisions of forest authorities. More effective legal mechanisms are also needed to control illegal forest extraction. The establishment of credible enforcement mechanisms – both vertically and horizontally – would discourage persons from attempting to circumvent the rules. As the case of honey extraction in Palawan reveals, NGOs can have an important role in improving the bargaining power of the local extractors in their negotiations with more powerful stakeholders. NGOs and other civil society actors can also provide important mechanisms to develop politically more transparent institutions of forest management. It is crucial that this issue should be addressed in order to ensure socially and politically sustainable forms of NTFP extraction.

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